

In the Claims

1. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 9 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said part thereof having at least 85%, preferably 90 %, more preferably 95 % homology with the nucleic acid sequence of the *Mycobacterium avium* subspecies *paratuberculosis* protein gene as depicted in SEQ ID NO: 5.~~

2. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 14 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said part thereof having at least 85%, preferably 90 %, more preferably 95 % homology with the nucleic acid sequence of the *Mycobacterium avium* subspecies *paratuberculosis* protein gene as depicted in SEQ ID NO: 3.~~

3. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 28 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said part thereof having at least 85%, preferably 90 %, more preferably 95~~

~~% homology with the nucleic acid sequence of the Mycobacterium avium 20 subspecies paratuberculosis protein gene as depicted in SEQ ID NO: 1.~~

4. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 47 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said part thereof having at least 85%, preferably 90 %, more preferably 95 % homology with the nucleic acid sequence of the Mycobacterium avium subspecies paratuberculosis protein gene as depicted in SEQ ID NO: 7.~~

5. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said 30 part thereof having at least 85%, preferably 90 A, more preferably 95 % homology with the nucleic acid sequence of the Mycobacterium avium subspecies paratuberculosis protein gene as depicted in SEQ ID NO: 9.~~

6. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part~~

~~of said nucleic acid sequence that encodes  
an immunogenic fragment of said protein, said nucleic acid  
sequence or said part thereof having at least 85%, preferably 90  
%, more preferably 95 % homology with the nucleic acid sequence  
of the *Mycobacterium avium* subspecies *paratuberculosis* protein  
gene as depicted in SEQ ID NO: 11.~~

7. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a  
*Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part  
of said nucleic acid sequence that encodes an immunogenic  
fragment of said protein, said nucleic acid sequence or said part  
thereof having at least 85%, preferably 90 %, more preferably 95  
% homology with the nucleic acid sequence of the *Mycobacterium*  
*avium* subspecies *paratuberculosis* protein gene as depicted in SEQ  
ID NO: 13.~~

8. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a  
*Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part  
of said nucleic acid sequence that encodes an immunogenic  
fragment of said protein, said nucleic acid sequence or said part  
thereof having at least 85%, preferably 90 %, more preferably 95  
% homology with the nucleic acid sequence of the *Mycobacterium*  
*avium* subspecies *paratuberculosis* protein gene as depicted in SEQ  
ID NO: 15.~~

9. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein, said nucleic acid sequence or said part thereof having at least 85%, preferably 90 %, more preferably 95 % homology with the nucleic acid sequence of the *Mycobacterium avium* subspecies *paratuberculosis* protein gene as depicted in SEQ ID NO: 17.~~

10. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 60 kD *Mycobacterium avium* subspecies *paratuberculosis* protein having a pI of 5.60-6.15 ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein.~~

11. (Currently Amended) ~~Nucleic~~ A nucleic acid sequence encoding a 33 kD *Mycobacterium avium* subspecies *paratuberculosis* protein having a pI of 4.20-4.75 ~~or a part of said nucleic acid sequence that encodes an immunogenic fragment of said protein.~~

12. (Currently Amended) A DNA fragment comprising a nucleic acid sequence according to claim ~~1-11~~ 1.

13. (Currently Amended) A recombinant ~~Recombinant~~ DNA molecule,

comprising:

a nucleic acid sequence according to claim 1 ~~1-11~~ ~~or a DNA fragment according to claim 12,~~ under the control of a functionally linked promoter.

14. (Currently Amended) A live ~~Live~~ recombinant carrier, comprising:

a nucleic acid sequence according to claim 1 ~~1-11~~, ~~a DNA fragment according to claim 12 or a recombinant DNA molecule according to claim 13.~~

15. (Currently Amended) A host ~~Host~~ cell, comprising:

a nucleic acid sequence according to claim 1 ~~1-11~~, ~~a DNA fragment according to claim 12, a recombinant DNA molecule according to claim 13 or a live recombinant carrier according to claim 14.~~

16. (Currently Amended) A 9 kD *Mycobacterium avium* subspecies *paratuberculosis* protein or an immunogenic fragment of said protein, ~~characterized in that~~ wherein said protein or immunogenic fragment thereof has a sequence homology of at least 90%, ~~preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 6.

17. (Currently Amended) A 14 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that wherein said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 4.

18. (Currently Amended) A 28 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that wherein said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 2.

19. (Currently Amended) A 47 kD *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that wherein said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 8.

20. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that wherein said protein or~~

~~immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 10.

21. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that~~ wherein ~~said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 12.

22. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that~~ wherein ~~said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 14.

23. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that~~ wherein ~~said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 16.

24. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* protein ~~or an immunogenic fragment of said protein, characterized in that wherein said protein or immunogenic fragment thereof has a sequence homology of at least 90%, preferably 92 %, more preferably 94 % to~~ having the amino acid sequence as depicted in SEQ ID NO: 18.

25. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* 60 kD protein having a pI of 5.60-6.15 ~~or an immunogenic fragment of said protein.~~

26. (Currently Amended) A *Mycobacterium avium* subspecies *paratuberculosis* 33 kD protein having a pI of 4.20-4.75 ~~or an immunogenic fragment of said protein.~~

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Currently Amended) ~~Vaccine~~ A vaccine for combating *Mycobacterium avium* subspecies *paratuberculosis* infection, ~~characterized in that said vaccine comprises~~ comprising:



at least one *Mycobacterium avium* subspecies *paratuberculosis* protein according to ~~claims 16-26~~ claim 16 ~~or an immunogenic fragment of said protein and~~

a pharmaceutically acceptable carrier.

31. (Currently Amended) ~~Vaccine~~ A vaccine for combating *Mycobacterium avium* subspecies *paratuberculosis* infection, ~~characterized in that said vaccine comprises~~ comprising:

a nucleic acid sequence according to claim 1 ~~claims 1-11, a DNA fragment according to claim 12, a recombinant DNA molecule according to claim 13, a live recombinant carrier according to claim 14 or a host cell according to claim 15 and~~

a pharmaceutically acceptable carrier.

32. (Currently Amended) ~~Vaccine~~ A vaccine for combating *Mycobacterium avium* subspecies *paratuberculosis* infection, ~~comprising: characterized in that said vaccine comprises~~

antibodies against a protein according to ~~claims 16-26~~ claim 16 ~~or an immunogenic fragment of said protein and~~

a pharmaceutically acceptable carrier.

33. (Currently Amended) ~~Vaccine~~ The vaccine according to ~~claims 30-32~~ claim 30, ~~characterized in that said vaccine~~ further comprising an adjuvant.

34) (Currently Amended) ~~Vaccine~~ The vaccine according to ~~claims~~  
~~30-33~~ claim 30, ~~characterized in that said vaccine comprises~~  
further comprising an additional antigen derived from a ~~virus or~~  
~~micro-organism pathogenic to cattle~~ pathogen, an antibody against  
said antigen or genetic information encoding said antigen.

35. (Currently Amended) ~~Vaccine~~ The vaccine according to claim  
34, ~~characterized in that~~ wherein said ~~virus or micro-organism~~  
~~pathogenic to cattle~~ pathogen is selected from the group  
consisting of Bovine Herpesvirus, bovine Viral Diarrhoea virus,  
Parainfluenza type 3 virus, Bovine Paramyxovirus, Foot and Mouth  
Disease virus, *Pasteurella haemolytica*, Bovine Respiratory  
Syncytial Virus, *Theileria sp.*, *Babesia sp.*, *Trypanosoma species*,  
*Anaplasma sp.*, *Neospora caninum*, *Staphylococcus aureus*,  
*Streptococcus agalactiae*, *Mycoplasma*, *E. coli*, *Enterobacter*,  
*Klebsiella*, *Citrobacter* and *Streptococcus dysgalactiae*.

36. (Currently Amended) ~~Method~~ A method for the preparation of a  
vaccine according to ~~claims~~ ~~30-35~~ claim 30, ~~said method~~  
comprising:

~~the admixing of a nucleic acid sequence according to claim 1~~  
~~claims 1-11, a DNA fragment according to claim 12, a recombinant~~  
~~DNA molecule according to claim 13, a live recombinant carrier~~  
~~according to claim 14, a host cell according to claim 15, a~~

~~protein according to claims 16-26 or antibodies against a protein according to claims 16-26, and~~

a pharmaceutically acceptable carrier.

37. (Currently Amended) A diagnostic kit, comprising:

suitable detection means and

a nucleic acid sequence according to claim 1 ~~claims 1-11~~ or a primer thereof, ~~a protein according to claims 16-26 or an immunogenic fragment thereof, or antibodies that are reactive with a protein according to claims 16-26.~~